



Automatic email responder

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Automation of email responses

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Introduction

Automatic Email Responder is a Python based project designed to streamline your email communication by automating the process of generating responses based on the context of incoming emails.

Managing emails can be a time-consuming task, especially when dealing with a high volume of incoming messages. The *Automatic Email Responder* is built to assist users in handling emails more efficiently by automating the response generation process.

This tool aims to fulfill two major points:

- **Managing quality of communication:** In the fast-paced world of digital communication, the need for swift yet high-quality responses are paramount. The *Automatic Email Responder* application excels in understanding the context of incoming emails, enabling it to craft contextually relevant responses. This ensures that your responses maintain the same level of quality and precision that you would deliver manually.
- **Saving time and increase efficiency:** Automation should not compromise quality. By automating the response generation process, this tool allows you to reclaim valuable time spent on repetitive email tasks. This time can be reinvested in more strategic and creative aspects of your work, boosting overall efficiency.

Structure

The structure of the application is divided into two main blocks, each of them using different Python libraries:

- **Email Retrieval/Creation:** by using *Google Gmail*'s API, the user will be able to login inside the application and make the tool retrieve and read incoming emails and prepare Draft email ready to be sent.
- **Reply Generation:** once retrieved the content of the message, the text will be sent to *OpenAI*'s ChatGPT API together with the context of the message to generate the most appropriate response to the message received.

The application is divided into different steps:

1. **Log-in:** the user will use his/her *Gmail* credentials in order to grant the application all authorizations needed in order to do make it work.
The user must give the application the authorization to read emails, edit email labels and create draft emails.
2. **Incoming email retrieval:** as said before, the application will read all incoming and unread emails. For each email, only needed information will be extracted (such as *email id, subject, sender*)
3. **Reply generation:** the context of the email, will be passed into *ChatGPT API* to create an appropriate response. In order to fulfill this requirement, a brief summary of the context of the user is needed; for example, if the user own a grocery store, he/she can notify the sender with additional information about his store (such as telephone number or street number)
4. **Draft email creation:** all previous information retrieved and generated will be used to create a new draft message to reply to the incoming email. The user can view the generated message from his account, inside the *Draft* label; it is important that the user must be the one to send the email. This chose is made because the generated reply might not be appropriate or satisfying from the point of view of the user.

Model choices

In implementing the Automatic Email Responder, several crucial decisions were made regarding the selection and utilization of models to ensure the success and effectiveness of the application.

Below are some of the key model choices:

- The decision to use the Google Gmail API was made for several reasons. Firstly, Gmail is one of the most widely used email platforms worldwide, ensuring broad compatibility of the application. Additionally, leveraging an official API provided by Google ensures secure and reliable interaction with the email service, allowing the application to access emails efficiently and securely.
- The OpenAI's ChatGPT API was chosen for response generation as it offers extensive knowledge and understanding of natural language. This advanced language model can comprehend the context of incoming emails and generating relevant and high-quality responses. Furthermore, the API is easily integrable into the application, enabling a seamless workflow for automatic response generation.
- In designing the application, particular attention was given to user privacy and data security. Gmail access credentials are handled securely and are neither stored nor shared by the application. Additionally, access to emails occurs through user-provided permissions and in compliance with Google's security policies.
- Strong emphasis was placed on the scalability and maintainability of the system in implementing the Automatic Email Responder. Solid and modular software development practices were adopted, allowing the application to be easily extendable and upgradable in the future. Furthermore, monitoring and logging mechanisms were integrated to enable thorough analysis of the application's performance and behavior over time.

These model choices were crucial in ensuring that the Automatic Email Responder is able to provide high-quality responses while maintaining the security and privacy of user data.

Outcomes

Different use cases are created in order to test the application performance and behavior when dealing with customers email.

Use Case 1: Cinema Website

Context

Manage a movie theater website. You have the following links available:

[<http://cinemawebsite.it>;'http:// cinemawebsite.it/schedule', 'http:// cinemawebsite.it/buy', 'http:// cinemawebsite.it/promotions_and_services', 'http:// cinemawebsite.it/about_us', 'number':'555-12335667'].

Answer customer questions about the service.

Questions and replies

1. “Can I purchase tickets online and pick them up at the venue?”

Yes, you can purchase tickets online through our website at <http://cinemawebsite.it/buy>. Once you have made the purchase, you can select the option to pick up the tickets at the venue.

2. “Do you have special deals or memberships for frequent visitors?”

Yes, we offer special promotions and memberships for frequent visitors. You can visit our "Promotions and Services" page on our website to learn more about the current deals and membership options available.

3. “hi, since i often come to your cinema and i would like to know if you have a sort of loyalty program or cards point. Thanks! let me know!”

Hello! **Yes, we do have a loyalty program called "Cinema Rewards."** With this program, you can earn points for every ticket purchase, which can be redeemed for discounts on future tickets or snacks at the concession stand. You can find more information about our loyalty program on our website under the "Promotions and Services" section. Let me know if you have any other questions!

4. “Good evening, yesterday i purchased a ticket for the last Marvel movie but cause to an unexpected event i could not be at cinema this night. Is there a sort of refund or ticket exchange system i could use? Thanks”

Good evening! I'm sorry to hear that you couldn't make it to the cinema last night. To inquire about a refund or ticket exchange, I suggest contacting the cinema directly. You can reach them at their phone number 555-12335667. They will be able to provide you with the necessary information regarding their refund or ticket exchange policies.

Result

The replies generated for this use case are quite satisfying, suggesting the customer to main web site pages when in doubt. There are obviously some problems when the customer asks questions or enter some concept area not covered by the initial context (as is it seen inside the 3rd question).

When dealing with these cases, ChatGPT tends to create replies that could not represent the actual context but could be true for the average cinema website as a generative AI built from different dataset and information.

This scenario could be avoided by setting more detailed information about the client context.

Let's make the application reply to the same question, but this time more information about services is added:

Manage a movie theater website.

...

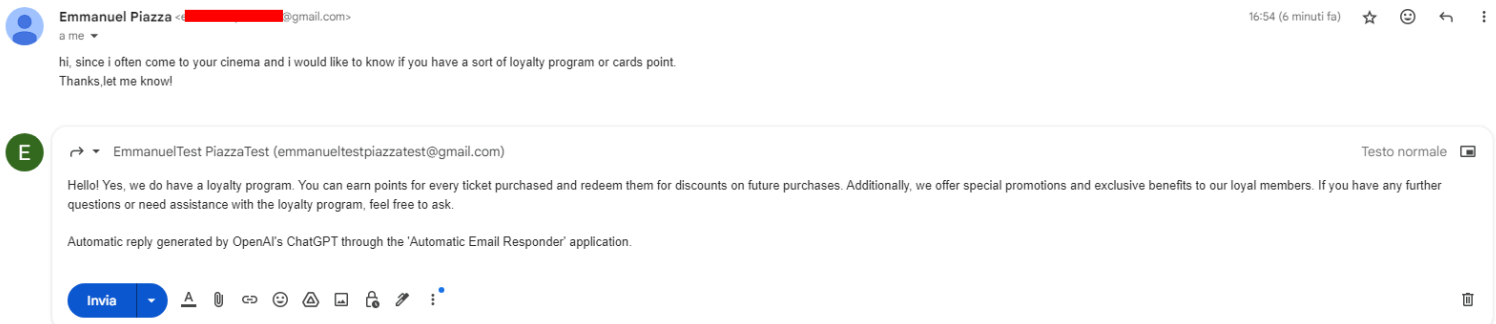
We have NOT loyalty programs. We can do ticket exchanges, more info inside the services page. Answer customer questions about the service.

...

Answer customer questions about the service.

With the following reply:

“Hello! Thank you for being a loyal customer. Unfortunately, we do not have a loyalty program or cards points at the moment. However, we offer various promotions and services that you might be interested in. If you have any other questions or need more information, feel free to ask!”



Response example on Gmail's Draft label

Use Case 2: Automatic feedback

Context

We own an online store. Manage clients feedback about our products and services. Always be kind. Shipments between 4-5 days. Return policy at '<http://onlinefurnaces.com/return>'. For complains, support service number: 555-123456789

Questions and replies

1. “I bought a fridge from your store and it doesn't work!!”

Thank you for reaching out to us regarding the issue with your fridge. We apologize for any inconvenience this may have caused you. Our team is here to assist you and resolve this matter as quickly as possible. To better understand the problem, could you please provide some more details about the specific issue you are facing with your fridge? This will help us determine the best course of action to resolve the problem. In the meantime, we kindly request that you refrain from using the faulty fridge and ensure it remains plugged in for our technicians to inspect it thoroughly. You can also contact our dedicated support service at 555-123456789 to expedite the resolution process. Once again, we apologize for the inconvenience and assure you that we are committed to providing excellent customer service. We will do our best to rectify the situation promptly.

2. “I bought a used tv from your store and after 4 days it still hasn't arrived yet. can you please, explain the situation?”

Dear customer,

Thank you for reaching out to us regarding your recent purchase of a used TV from our store. We appreciate your patience and apologize for any inconvenience caused by the delay in the delivery of your product. Please provide us with your order number or any other relevant details so that we can investigate the situation and provide you with an accurate explanation. Once we have your information, we will promptly contact our shipping partner to inquire about the status of your delivery. It is our priority to ensure that our customers receive their orders in a timely manner, and we sincerely apologize for any inconvenience this delay may have caused. We are committed to resolving this matter as quickly as possible and will keep you informed throughout the process. Please don't hesitate to contact our support service number, 555-123456789, for further assistance or if you have any other concerns. We are here to help and make your shopping experience a positive one. Thank you for your understanding, and we look forward to resolving this issue for you. Kind regards,
[Your Name] Customer Support Team

3. “I really appreciated your customer service! they were extremely helpful!”

Thank you for your kind words! We are thrilled to hear that our customer service team was able to assist you and provide you with exceptional service. We strive to ensure that our customers have a positive experience with us and we are glad that we met your expectations. If you need any further assistance, please do not hesitate to reach out to us. Have a great day!

4. I bought a chair but i don't want it anymore! it's not like in the photo

We're sorry to hear that you're unsatisfied with your purchase. Please refer to our return policy at '<http://onlinefurnaces.com/return>' for information on how to proceed with returning the chair. If you have any further questions or require assistance, please contact our support service at 555-123456789. We apologize for any inconvenience caused and appreciate your understanding.

Result

The implementation of the automatic feedback system in our online store has proven to be highly effective in managing customer inquiries and concerns by displaying empathy, apologizing for the inconvenience, and providing clear instructions on how to proceed for a quick resolution when faced against complaints.

The automatic feedback system has not only facilitated efficient communication but has also demonstrated commitment to customer-centricity, prompt issue resolution, and clear communication of policies, ultimately contributing to a positive customer experience on our online platform.

Application

```
Automatic Email Responder

No sleep time (seconds) specified, default value set to: 10
Prompt retrieved, summary: 'Insert your prompt here'
Gmail authentication completed
OpenAI key retrieved
Are you sure you want to start the app with these settings? (y/n)
```

Application's initial interface

The application's work consists into a periodic check for incoming email with the subsequential generation of the response into the draft emails folder, every step of this flow of work will be reported into the command line as logs.

During the start-up phase, the application will check that all configuration has been correctly settled.

Those configurations consist into:

- **Sleep time:** as said, the application consists in periodic check for new mail. The sleep time between one check and another can be settled when launching the application by adding a numeric value as argument. This parameter is optional and if not defined the default value will be used (10). *Time is calculated in seconds.*
- **Prompt:** a prompt text containing the context of the response is needed to generate it for incoming mails. The user must insert a prompt text inside the *prompt.txt* file to proceed.
- **Gmail authentication:** in order to read incoming email, the user must login with its Gmail account credentials. After the first login, the application will save all information inside a *token.json* file for a faster login.
- **OpenAI API key:** key needed to use ChatGPT's API.

```
Incoming messages:

From : Emmanuel Piazza <[REDACTED]@gmail.com>
Subject : Domanda
To : "emmanueltestpiazatest@gmail.com" <emmanueltestpiazatest@gmail.com>
Message [ 18cf8127a4fe1534 ] labeled as readed
Draft message correctly created
```

Response creation logs

Improvements

There are several potential implementations that could further extend the application's functionality and utility.

Some of these possible implementations include:

- **Integration with additional email providers:** While the current implementation focuses on Google Gmail API for email access, integrating with other email providers such as Outlook, Yahoo, or custom IMAP/POP3 servers.
- **Customization options:** Providing users with the ability to customize and personalize response templates, keywords, and triggers can enhance the application's flexibility and adaptability to individual preferences and communication styles. This could include features such as dynamic insertion of user-specific information, advanced filtering and categorization of incoming messages.
- **Natural language understanding enhancements:** Continuously improving the natural language understanding capabilities of the application through advanced machine learning and NLP techniques can enhance response accuracy and relevance. This could involve fine-tuning response generation models based on user feedback, integrating domain-specific knowledge bases, and leveraging contextual information from previous interactions.
- **Multi-language support:** Expanding the application's language support beyond English to include other languages can cater to a more diverse user base. This would require adapting response generation models and language processing pipelines to support multilingual communication.